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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/575,237	05/22/2000	Hiroyuki Akashi	P00,0483	1992

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EXAMINER

CHANEY, CAROL DIANE

ART UNIT PAPER NUMBER

1745

DATE MAILED: 01/29/2002

9

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/575,237

Applicant(s)

AKASHI ET AL. 

Examiner

Carol Chaney

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on 22 January 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☐ Claim(s) 1-38 is/are pending in the application.
- 4a) Of the above claim(s) 11-38 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) 1-10 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 6.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

Election/Restrictions

Applicant's election of Species 1 in Paper No. 9 is acknowledged. Because applicant did not distinctly and specifically point out the supposed errors in the restriction requirement, the election has been treated as an election without traverse (MPEP § 818.03(a)).

Specification

A substitute specification in proper idiomatic English and in compliance with 37 CFR 1.52(a) and (b) is required. The substitute specification filed must be accompanied by a statement that it contains no new matter.

Claims 1-10 are objected to because of the following informalities:

The commonly accepted United States spelling of the term describing polyethylene, polypropylene, etc. materials is "polyolefin" rather than "polyolefine".

In claim 1, the number and location of battery elements is unclear from the phrase "solid electrolytes each of which is disposed between..."

In claim 1, the term 'vacancy ratio' is not an art-recognized term. The claims are examined interpreting the term to mean "volume porosity of the separator".

Appropriate correction is required.

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Claim Rejections - 35 USC § 103

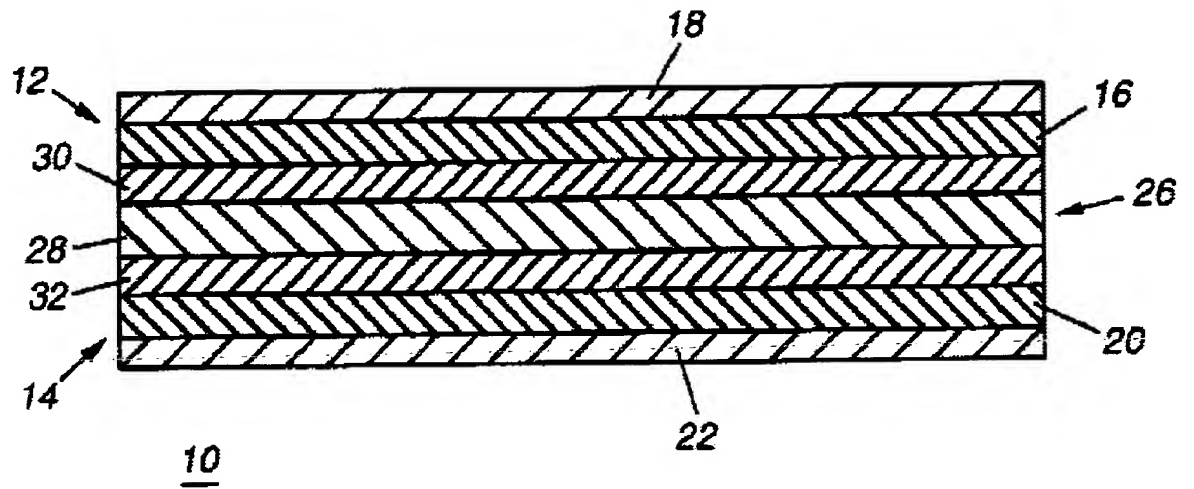
The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Pandalwar et al., US Patent 5,716,421 with evidence shown by Spotnitz et al., UP Patent 6,322,923.

Pandalwar et al. disclose a battery which includes a lithium intercalation material cathode (14), a carbon anode (12) and an electrolyte system (26). (Note column 3, lines 24-40 and 51-64.)

The electrolyte system includes an inert phase (28) and absorbing phases (30, 32). The inert phase may include a plurality of porous polymeric layers, formed from polyalkenes such as polyethylene, polypropylene, or other polymers such as polytetrafluoroethylene, polyethyleneterephthalate, polystyrene, ethylene propylene diene monomer, nylon, and combinations thereof. In one preferred embodiment, layer 54 is fabricated of polyethylene, while layers 56 and 58 are fabricated of polypropylene. (Note column 4, lines 33-41.)



Cross-section of battery, US Patent 5,716,421 Figure 1.

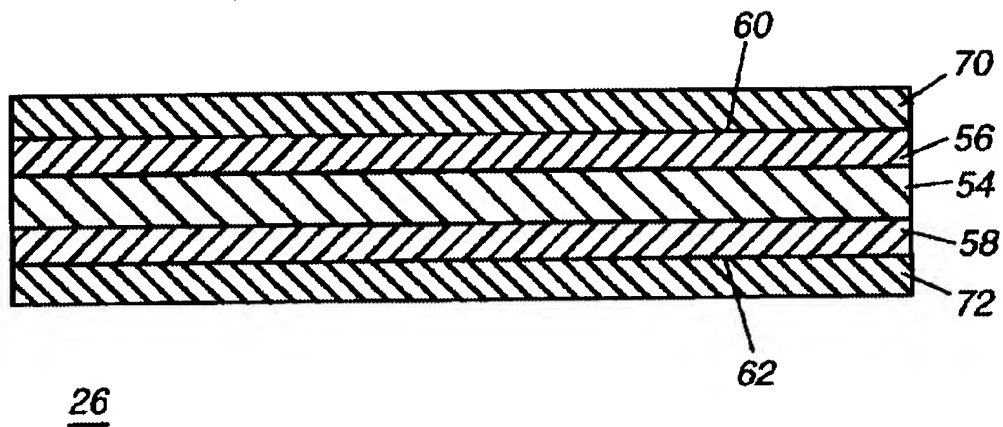


FIG. 2

Cross-section of electrolyte system, US Patent 5,716,421

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The layers 70 and 72 are absorbing or gel forming polymers. The absorbing or gel-forming polymer may be selected from the group of polymers including polyvinylidene fluoride (PVDF), polyurethane, polyethylene oxide, polyacrylonitrile, polymethylacrylate, polyacrylamide, polyvinylacetate, polyvinylpyrrolidone, polytetraethylene glycol diacrylate, copolymers of any of the foregoing, and combinations thereof. Because polyvinylidene fluoride/hexafluoropolypropylene copolymers are commercially available materials, marketed as Hylar, KF, Kynar and Kynar Flex polymers, one of ordinary skill in the art would recognize the above-mentioned listing to encompass polyvinylidene fluoride/hexafluoropolypropylene copolymers.

The solvent used with the gel forming polymer may be, but is not limited to, propylene carbonate (PC), ethylene carbonate (EC), diethyl carbonate (DEC), dimethyl carbonate (DMC), dipropylcarbonate dimethylsulfoxide, acetonitrile, dimethoxyethane, tetrahydrofuran, n-methyl-2-pyrrolidone (NMP), acetone and combinations thereof.

When the battery system taught by Pendalwar et al. is heated above a threshold temperature, (135 °C for polyethylene) one or more of the polymer support structure layers (54, 56, 58 of Fig. 2) will melt, thereby cutting off ionic conductivity in the battery. The battery impedance is higher at 135 °C than it is at room temperature. (Note Figure 5.)

The disclosure of Pendalwar et al. differs from applicants' invention in that Pendalwar et al. do not recite specific thicknesses or porosities of porous separator layers. However, one of ordinary skill in the art would recognize separator thicknesses

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between 5 and 15 microns and porosities between 25 and 60% to be conventional in the art, as evidenced by Spotnitz et al., US Patent 6,322,923, column 2, lines 26-52.

Thus, applicants' invention as a whole would have been obvious to one of ordinary skill in the art.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Gozdz et al., "Fabrication and Performance Characteristics of Plastic Li-Ion Batteries with Bonded Untreated Microporous Polyolefin Separators", presented at the 198th Meeting of the Electrochemical Society, Phoenix, AZ, October 22-27, 2000.

Conclusion

1. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Carol Chaney whose telephone number is (703) 305-3777. The examiner can normally be reached on Monday-Friday from 8:00 am to 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gabrielle Brouillette, may be reached at the telephone number (703) 308-0756. The official fax number for the organization where this application or proceeding is assigned is (703) 305-3599.

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Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.



Carol Chaney
Primary Examiner
Art Unit 1745
January 24, 2002